

Notice of Allowability

Application No.

10/697,552

Examiner

Sean P. Shechtman

Applicant(s)

TOYSERKANI ET AL.

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2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/14/05.
2. ☒ The allowed claim(s) is/are 1,4-18,20-31 and 34-54.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>5/14/04</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

1. Claims 1, 4-18, 20-31, 34-54 are presented for examination. Claims 1, 4-9, 12, 15-18, 20, 22, 24, 26, 27, 31, 34-36, have been amended. Claims 37-54 have been added. Claims 2, 3, 19, 32 and 33, have been cancelled.

Information Disclosure Statement

2. Objection withdrawn in light of the amendment filed October 14th 2005.

Drawings

3. Objection withdrawn in light of the amendment filed October 14th 2005.

Claim Rejections - 35 USC § 112

4. Rejection withdrawn in light of the amendment filed October 14th 2005.

Claim Rejections - 35 USC § 102

5. Rejection withdrawn in light of the amendment filed October 14th 2005.

Claim Rejections - 35 USC § 103

6. Rejection withdrawn in light of the amendment filed October 14th 2005.

Allowable Subject Matter

7. Claims 1, 4-18, 20-31, 34-54 are allowed.

The following is an examiner's statement of reasons for allowance:

While Koch and Griffith teaches image detection means for capturing images of an interaction region between a laser light beam and powder injected onto a substrate surface; and a computer control means connected to said laser, positioning means and said powder injection means, and said computer control means including image processing means for the processing images of the interaction region between said laser light beam and powder injected onto said

substrate surface and extracting from said images pre-selected properties of the growing clad in real-time.

And, Otsu teaches processing captured images includes producing a binary black and white image in which black indicates one of either counts or measurements of geometric characteristics of objects respectively and the white areas indicates the other, wherein the step of processing the captured images includes projection of the images received from the image detectors onto a reference plane using a transformation matrix that is obtained based on orientations of the detectors with respect to the reference plane.

Referring to claims 1 and 37, neither Koch, Griffith, nor Otsu, taken alone or in obvious combination disclose a system and method for producing a cladding on a substrate having all the claimed features of applicant's instant invention, specifically including: laser processing of powder including fuzzifying the difference between the extracted pre-selected properties of the growing clad in real-time and the desired values of the pre-selected properties of the growing clad, combining the fuzzified difference between the extracted pre-selected properties and the desired values of the pre-selected properties of the growing clad using an inference engine to produce fuzzified outputs, and defuzzifying the fuzzified outputs to produce quantitative values, and using said quantitative values to adjust processing parameters to give the desired values of the pre-selected properties of the clad.

Referring to claim 15, neither Koch, Griffith, nor Otsu, taken alone or in obvious combination disclose a method for producing a cladding on a substrate having all the claimed features of applicant's instant invention, specifically including: processing the captured images of the interaction region between the laser light beam and the powder injected onto the substrate

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surface and extracting from the images pre-selected properties of a clad in real-time by merging of the images received from the at least two image detectors using an effective morphological structuring element neighborhood method and to obtain therefrom two matrices, one of the matrices being a boundary matrix representing boundaries of the clad on the substrate and another matrix being an overlap matrix representing the overlap between the at least two images captured by the at least two image detectors, and calculating a difference between the extracted pre-selected properties to desired values of the pre-selected properties produced by an effective model of cladding growth by laser processing of powder, and using the difference to adjust processing parameters to give the real time values of the pre-selected properties of the clad.

Also, there is no motivation to combine Koch, Griffith, or Otsu to meet these limitations. It is for these reasons that applicant's invention defines over the prior art of record. Claims 1, 4-18, 20-31, 34-54, depend from claims 1, 15, and 37, and are therefore also allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Shechtman whose telephone number is (571) 272-3754. The examiner can normally be reached on 9:30am-6:00pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SPS

Sean P. Shechtman

December 8, 2005

A handwritten signature in dark ink, appearing to read 'L. P. Picard', with a stylized, flowing script.

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100